Huawei CH121 V5 (Intel Xeon Bronze 3106)

**SPECrate2017_fp_base = 56.2**

**SPECrate2017_fp_peak = 57.5**

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>SPECrate2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.5</td>
<td>56.2</td>
</tr>
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</table>

### Hardware

- **CPU Name:** Intel Xeon Bronze 3106
- **Max MHz.:** 1700
- **Nominal:** 1700
- **Enabled:** 16 cores, 2 chips
- **Orderable:** 1,2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 1 MB I+D on chip per core
- **L3:** 11 MB I+D on chip per core
- **Other:** None
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2133)
- **Storage:** 1 x 1200 GB SAS, 10000 RPM
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux Server release 7.4 (Maipo)
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux;
  Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
- **Parallel:** No
- **Firmware:** Version 0.62 Released Mar-2018
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None

---

**Huawei**

Huawei CH121 V5 (Intel Xeon Bronze 3106)

**CPU2017 License:** 3175

**Test Sponsor:** Huawei

**Tested by:** Huawei

**Hardware Availability:** Jul-2017

**Software Availability:** Jan-2018

**Test Date:** Jun-2018

---

**503.bwaves_r** 16

**507.cactuBSSN_r** 16

**508.namd_r** 16

**510.parest_r** 16

**511.povray_r** 16

**519.ibm_r** 16

**521.wrf_r** 16

**526.blender_r** 16

**527.cam4_r** 16

**538.imagick_r** 16

**544.nab_r** 16

**549.fotonik3d_r** 16

**554.roms_r** 16

---

**SPECCrete2017_fp_base (56.2)**

**SPECCrete2017_fp_peak (57.5)**
SPEC CPU2017 Floating Point Rate Result

Huawei
Huawei CH121 V5 (Intel Xeon Bronze 3106)

SPECrate2017_fp_base = 56.2
SPECrate2017_fp_peak = 57.5

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei
Test Date: Jun-2018
Hardware Availability: Jul-2017
Software Availability: Jan-2018

Results Table

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</tr>
</tbody>
</table>

SPECrate2017_fp_base = 56.2
SPECrate2017_fp_peak = 57.5

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes
The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.

Operating System Notes
Stack size set to unlimited using "ulimit -s unlimited"

General Notes
Environment variables set by runcpu before the start of the run:

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
filesystem page cache synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Huawei
Huawei CH121 V5 (Intel Xeon Bronze 3106)

SPECratened_fp_base = 56.2
SPECratened_fp_peak = 57.5

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Test Date: Jun-2018
Hardware Availability: Jul-2017
Software Availability: Jan-2018

General Notes (Continued)

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Platform Notes

BIOS configuration:
Power Policy Set to Performance
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on localhost.localdomain Tue Jun 12 15:48:07 2018

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Bronze 3106 CPU @ 1.70GHz
  2 "physical id"s (chips)
  16 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 8
siblings : 8
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Bronze 3106 CPU @ 1.70GHz
Stepping: 4
CPU MHz: 1700.000
BogoMIPS: 3400.00

(Continued on next page)
Huawei

Huawei CH121 V5 (Intel Xeon Bronze 3106)

SPECrate2017_fp_base = 56.2
SPECrate2017_fp_peak = 57.5

Platform Notes (Continued)

Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
Flags: fpu vme de pse tsc msr pae mca cmov cp gnu
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpd cm cdc cca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaves v msetb v msetc xgetbv cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm arat pln pts

From /proc/cpuinfo cache data

cache size : 11264 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7
node 0 size: 195701 MB
node 0 free: 190284 MB
node 1 cpus: 8 9 10 11 12 13 14 15
node 1 size: 196608 MB
node 1 free: 191552 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo

MemTotal: 395141240 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*

os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"

(Continued on next page)
Huawei CH121 V5 (Intel Xeon Bronze 3106)

SPECrate2017_fp_base = 56.2
SPECrate2017_fp_peak = 57.5

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Platform Notes (Continued)

VARIANT_ID="server"
VERSION_ID="7.4"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

uname -a:
Linux localhost.localdomain 3.10.0-693.11.6.el7.x86_64 #1 SMP Thu Dec 28 14:23:39 EST 2017 x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Jun 12 05:57

SPEC is set to: /spec2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda4      xfs   700G   35G  666G   5% /

Additional information from dmidecode follows. WARNING: Use caution when you interpret
this section. The 'dmidecode' program reads system data which is "intended to allow
hardware to be accurately determined", but the intent may not be met, as there are
frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS INSYDE Corp. 0.62 03/26/2018
Memory:
 24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666, configured at 2133

(End of data from sysinfo program)

Compiler Version Notes

===============================================================
  CC  519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base)
===============================================================

== icc (ICC) 18.0.0 20170811 ==
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

===============================================================
  CC  519.lbm_r(peak) 544.nab_r(peak)
===============================================================

== icc (ICC) 18.0.0 20170811 ==
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

===============================================================
  CXXC 508.namd_r(base) 510.parest_r(base)
===============================================================

(Continued on next page)
## Huawei CH121 V5 (Intel Xeon Bronze 3106)

<table>
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<td>Test Sponsor:</td>
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<td>Jul-2017</td>
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<td>Software Availability:</td>
<td>Jan-2018</td>
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### SPEC CPU2017 Floating Point Rate Result

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECrate2017_fp_base</th>
<th>SPECrate2017_fp_peak</th>
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<tbody>
<tr>
<td></td>
<td>56.2</td>
<td>57.5</td>
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</tbody>
</table>

### Compiler Version Notes (Continued)

```
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```
CXXC 508.namd_r(peak) 510.parest_r(peak)
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```
CC 511.povray_r(base) 526.blender_r(base)
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```
CC 511.povray_r(peak) 526.blender_r(peak)
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```
FC 507.cactusBSSN_r(base)
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```
## SPEC CPU2017 Floating Point Rate Result

### Huawei

**Huawei CH121 V5 (Intel Xeon Bronze 3106)**

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**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Test Date:** Jun-2018  
**Tested by:** Huawei  
**Software Availability:** Jan-2018  
**Hardware Availability:** Jul-2017

### Compiler Version Notes (Continued)

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<tr>
<td>icc (ICC)</td>
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#### Base Compiler Invocation

- **C benchmarks:**
  - icc

- **C++ benchmarks:**
  - icpc

- **Fortran benchmarks:**
  - ifort

(Continued on next page)
## Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

```bash
ifort icc
```

Benchmarks using both C and C++:

```bash
icpc icc
```

Benchmarks using Fortran, C, and C++:

```bash
icpc icc ifort
```

## Base Portability Flags

- `503.bwaves_r`: `-DSPEC_LP64`
- `507.cactusBSSN_r`: `-DSPEC_LP64`
- `508.namd_r`: `-DSPEC_LP64`
- `510.parest_r`: `-DSPEC_LP64`
- `511.povray_r`: `-DSPEC_LP64`
- `519.lbm_r`: `-DSPEC_LP64`
- `521.wrf_r`: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
- `526.blender_r`: `-DSPEC_LP64 -DSPEC_LINUX -funsigned-char`
- `527.cam4_r`: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
- `538.imagick_r`: `-DSPEC_LP64`
- `544.nab_r`: `-DSPEC_LP64`
- `549.fotonik3d_r`: `-DSPEC_LP64`
- `554.roms_r`: `-DSPEC_LP64`

## Base Optimization Flags

**C benchmarks:**

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3
```

**C++ benchmarks:**

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3
```

**Fortran benchmarks:**

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
```
Huawei CH121 V5 (Intel Xeon Bronze 3106)

SPECrate2017_fp_base = 56.2
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CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Test Date: Jun-2018
Hardware Availability: Jul-2017
Software Availability: Jan-2018

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Benchmarks using both Fortran and C:
-m64 -std=c11

Benchmarks using both C and C++:
-m64 -std=c11

Benchmarks using Fortran, C, and C++:
-m64 -std=c11

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

(Continued on next page)
Huawei CH121 V5 (Intel Xeon Bronze 3106)

| SPECrate2017_fp_base = 56.2 |
| SPECrate2017_fp_peak = 57.5 |

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Test Date: Jun-2018
Hardware Availability: Jul-2017
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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

538.imagick_r -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

544.nab_r: Same as 519.lbm_r

C++ benchmarks:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:
503.bwaves_r: basepeak = yes
549.fotonik3d_r: basepeak = yes
554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs

(Continued on next page)
Huawei

Huawei CH121 V5 (Intel Xeon Bronze 3106)

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**Peak Optimization Flags (Continued)**

554.roms_r (continued):
- `align array32byte`

Benchmarks using both Fortran and C:

521.wrf_r:
- `-prof-gen(pass 1)`
- `-prof-use(pass 2)`
- `-ipo
- `-xCORE-AVX2 -O3`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`
- `-qopt-mem-layout-trans=3`
- `-nostandard-realloc-lhs`
- `-align array32byte`

527.cam4_r:
- `basepeak = yes`

Benchmarks using both C and C++:

- `-prof-gen(pass 1)`
- `-prof-use(pass 2)`
- `-ipo
- `-xCORE-AVX2 -O3`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`
- `-qopt-mem-layout-trans=3`

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r:
- `basepeak = yes`

**Peak Other Flags**

C benchmarks:
- `-m64
- `-std=c11`

C++ benchmarks:
- `-m64`

Fortran benchmarks:
- `-m64`

Benchmarks using both Fortran and C:
- `-m64
- `-std=c11`

Benchmarks using both C and C++:
- `-m64
- `-std=c11`

Benchmarks using Fortran, C, and C++:
- `-m64
- `-std=c11`
## SPEC CPU2017 Floating Point Rate Result

**Huawei**

**Huawei CH121 V5 (Intel Xeon Bronze 3106)**

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The flags files that were used to format this result can be browsed at:
- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html)

You can also download the XML flags sources by saving the following links:
- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml)

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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